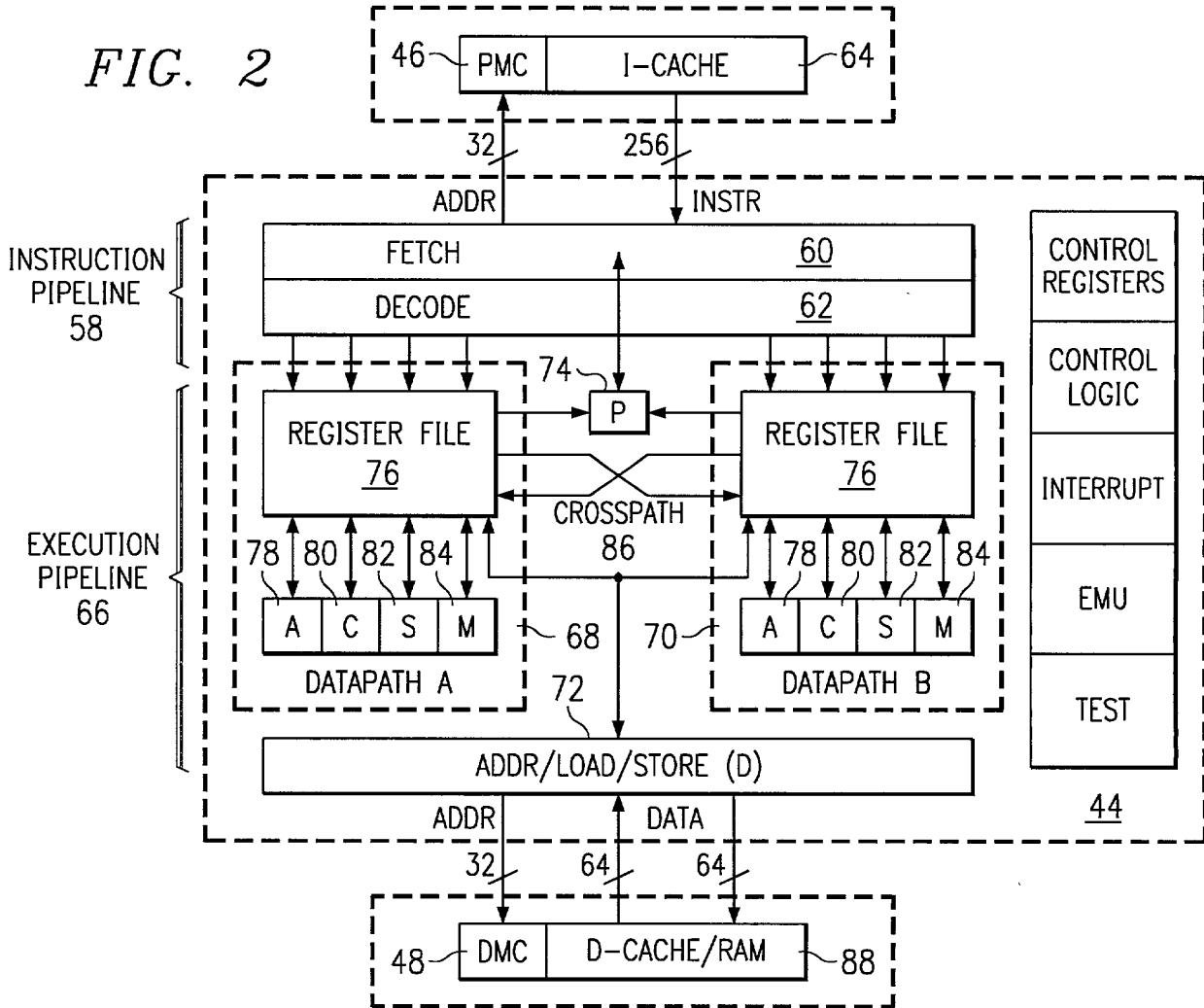


FIG. 1

FIG. 2



UNIT GROUP	OPERATIONS	REGISTER FILE ACCESS	
		PRIMARY DATAPATH	ALTERNATIVE DATAPATH
A	GENERAL ARITHMETIC BOOLEAN AND CONTROL REGISTER ACCESS	R/W	R
C	COMPARE, SHIFT, BOOLEAN ARITHMETIC: ADD, SUB	R/W	R
S	SHIFT, ROTATE, EXTENDED BOOLEAN ARITHMETIC: ADD, SUB	R/W	R
M	MULTIPLY ARITHMETIC: ADD, SUB	R/W	R
D	LOAD STORE ADDRESS COMPUTATION	W TO BOTH R FROM BOTH R/W BOTH	
P	BRANCH	R FROM BOTH	

FIG. 3

R=READ, W=WRITE



STAGE	FUNCTION
F0	SEND PC TO PROGRAM MEMORY CONTROLLER. LDIP ASSIGNED.
F1	CACHE BLOCK SELECT.
F2	ADDRESS PHASE OF INSTRUCTION CACHE ACCESS.
F3	DATA PHASE OF INSTRUCTION CACHE ACCESS.
F4	FETCH PACKET SENT TO DSP.

*FIG. 5a*

STAGE	FUNCTION
D0	DETERMINE VALID INSTRUCTIONS IN CURRENT FETCH PACKET.
D1	SORTS INSTRUCTIONS IN EXECUTE PACKET ACCORDING TO DESTINATION UNITS.
D2	INSTRUCTIONS SENT TO DESTINATION UNITS. CROSSPATH REGISTER READS OCCUR.
D3	UNITS DECODE INSTRUCTIONS. REGISTER FILE READ (2ND PHASE).

*FIG. 5b*

UNIT	STAGE	FUNCTION
NON M UNIT	E	EXECUTION OF OPERATION BEGINS AND COMPLETES. FULL RESULT AVAILABLE AT END OF CYCLE.
M UNIT	M0	EXECUTION OF MULTIPLY OPERATION BEGINS. (OR, NON-MULTIPLY OPERATION BEGINS AND COMPLETES.)
M UNIT	M1	MULTIPLY OPERATION CONTINUES. (OR, NON-MULTIPLY RESULT WRITTEN TO REGISTER FILE (PHASE 1).)
M UNIT	M2	MULTIPLY OPERATION COMPLETES.

*FIG. 5c*

STAGE	FUNCTION
E	ADDRESS GENERATION OCCURS. REGISTER FILE ACCESS FOR READ DATA.
L0	LOAD ADDRESS GENERATED DURING E IS SENT TOWARDS THE DMC.
L1	ADDRESS DECODE, TC ARBITRATION, TAG COMPARES.
L2	ADDRESS DECODE, TC ARBITRATION, TAG COMPARES.
L3	ADDRESS PHASE OF DATA CACHE ACCESS.
L4	DATA PHASE OF DATA CACHE ACCESS.
L5	64-BIT DATA SENT TO DSP.

*FIG. 5d*

STAGE	FUNCTION
E	ADDRESS GENERATION OCCURS. REGISTER FILE ACCESS FOR WRITE DATA.
S0	ADDRESS SENT TO DMC.
S1	ADDRESS DECODE IN DMC. WRITE DATA ALIGNMENT.
S2	TAG COMPARE IN DMC. WRITE DATA SENT TO DMC.
S3	ADDRESS PHASE IN DATA CACHE.
S4	DATA PHASE IN DATA CACHE.

*FIG. 5e*

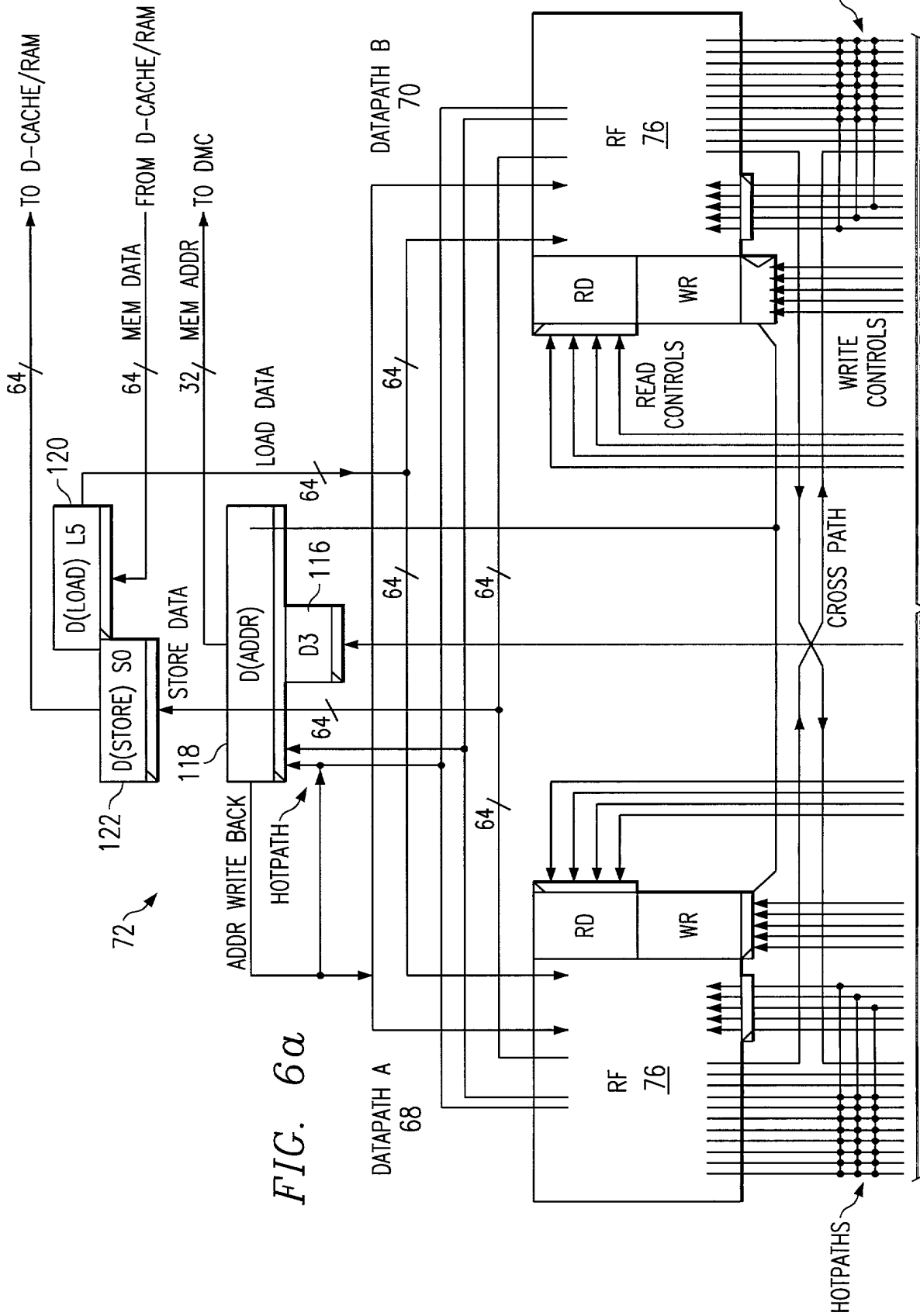
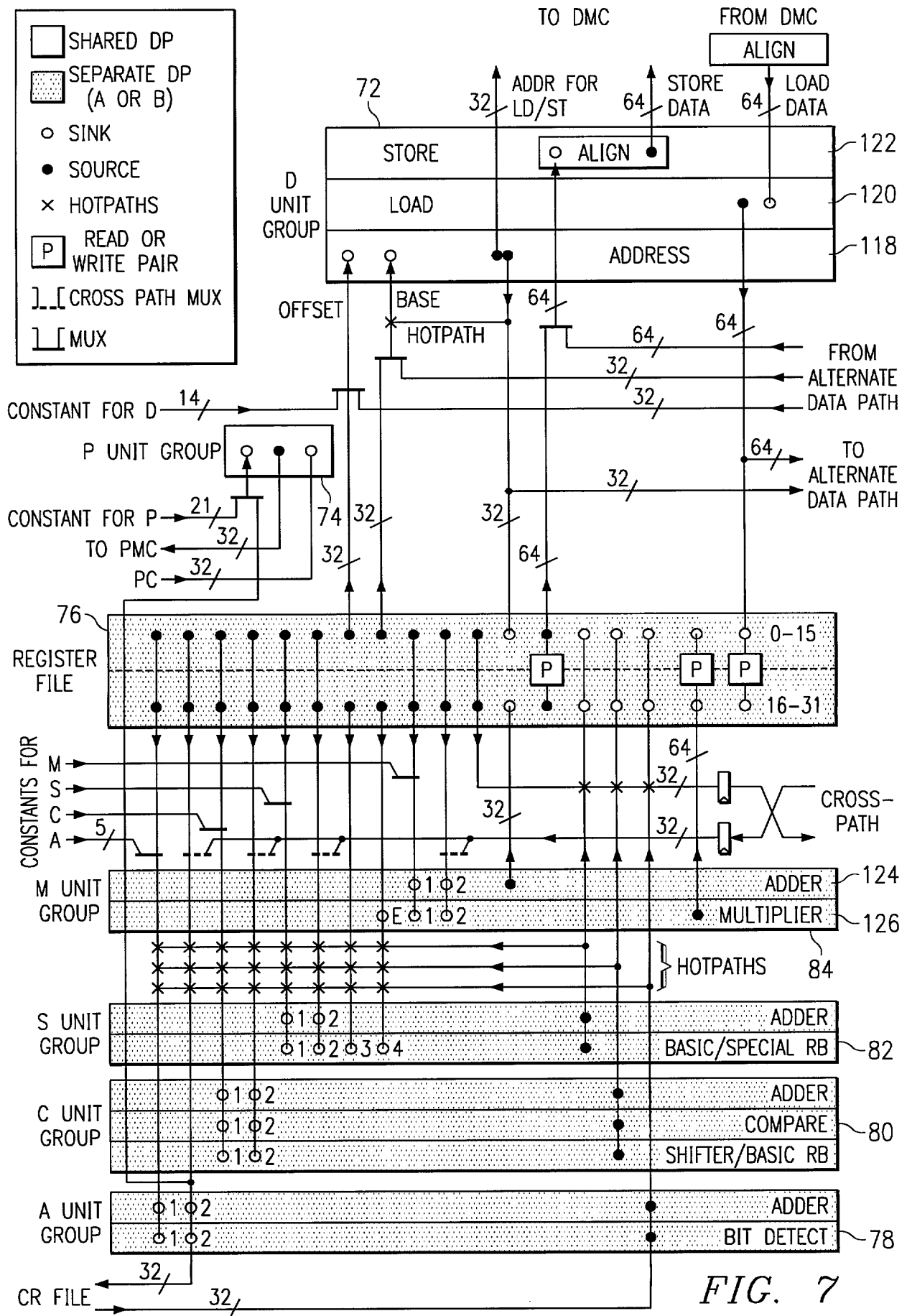


FIG. 6a

TO FIG. 6B





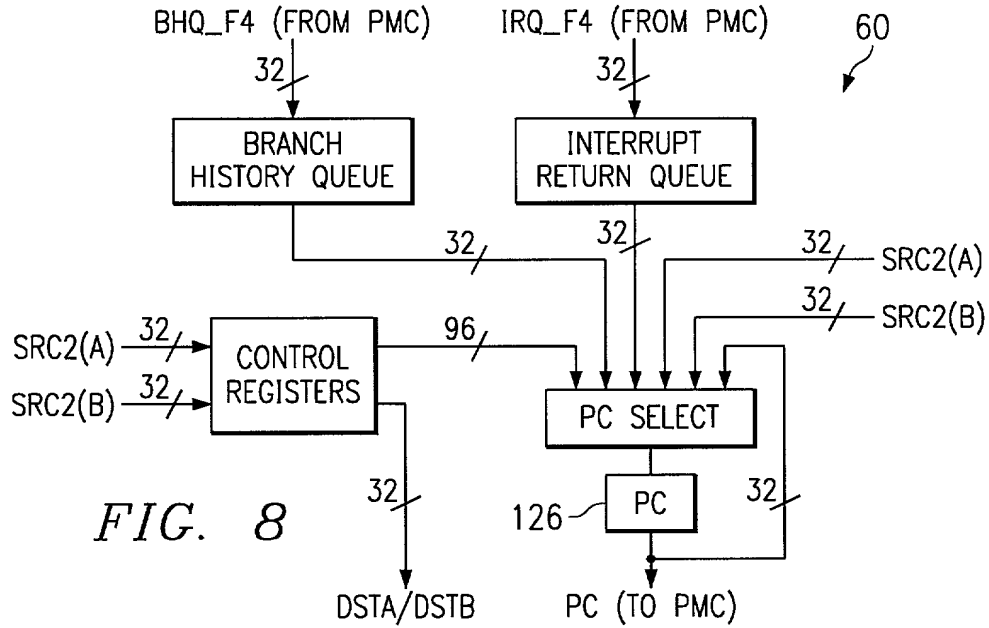


FIG. 8

|| [PREDICATION REG] INSTRUCTION\_MNEMONIC .UNIT-DATAPATH-CROSSPATH OP1, OP2, DST

WHERE:

|| =TO BE SCHEDULED IN PARALLEL WITH PRECEDING INSTRUCTION(S)  
[PREDICATION REG] =REGISTER CONTAINING PREDICATION VALUE  
.UNIT =A,C,S,M,D,P UNIT GROUPS  
DATAPATH =1 FOR DATAPATH A, 2 FOR DATAPATH B  
CROSSPATH =X IF ONE OPERAND COMES FROM OPPOSITE REGISTER FILE  
OP1, OP2 =SOURCE REGISTERS  
DST =DESTINATION REGISTER

UNIT GROUP	ASSEMBLY NOTATIONS		ASSEMBLY EXAMPLES	WITH CROSSPATH
	DATAPATH A	DATAPATH B		
A	.A1	.A2	ADD .A1 A1,A2,A3 SUB .A2 B1,B2,B3	ADD .A1X A1,B2,A3 SUB .A2X B1,A2,B3
C	.C1	.C2	CMPEQ .C1 A1,A2,A3 CMPEQ .C2 B1,B2,B3	CMPEQ .C1X A1,B2,A3 CMPEQ .C2X B1,A2,B3
S	.S1	.S2	SHL .S1 A1,A2,A3 SHL .S2 B1,B2,B3	SHL .S1X A1,B2,A3 SHL .S2X B1,A2,B3
M	.M1	.M2	MPY .M1 A1,A2,A3 MPY .M2 B1,B2,B3	MPY .M1X A1,B2,A3 MPY .M2X B1,A2,B3
D	.D		LDB .D *A8,A12 STB .D A8,*A12 ADDAH .D A8,A2,B1	n/a
P	.P		B A8	n/a

FIG. 15



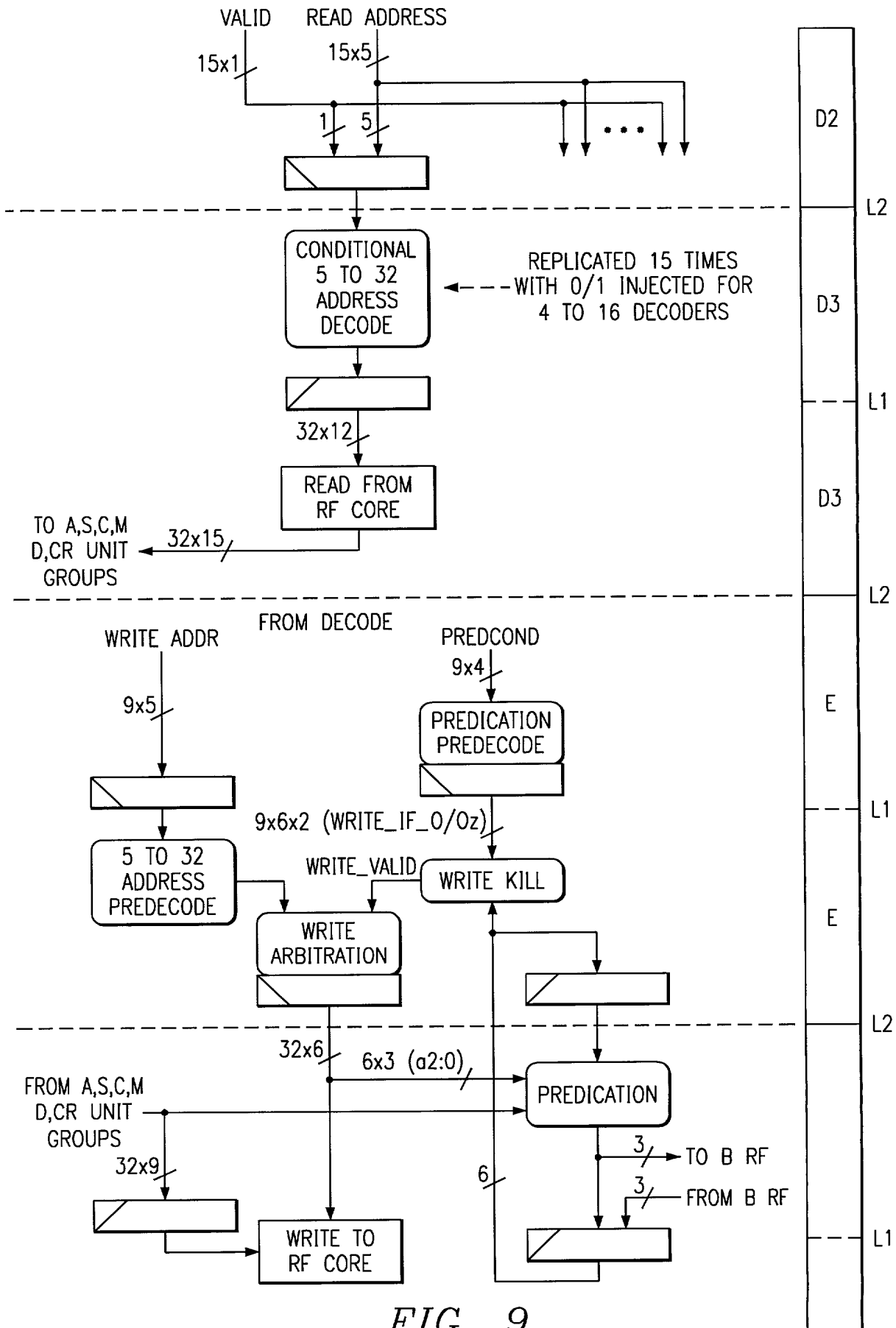


FIG. 9

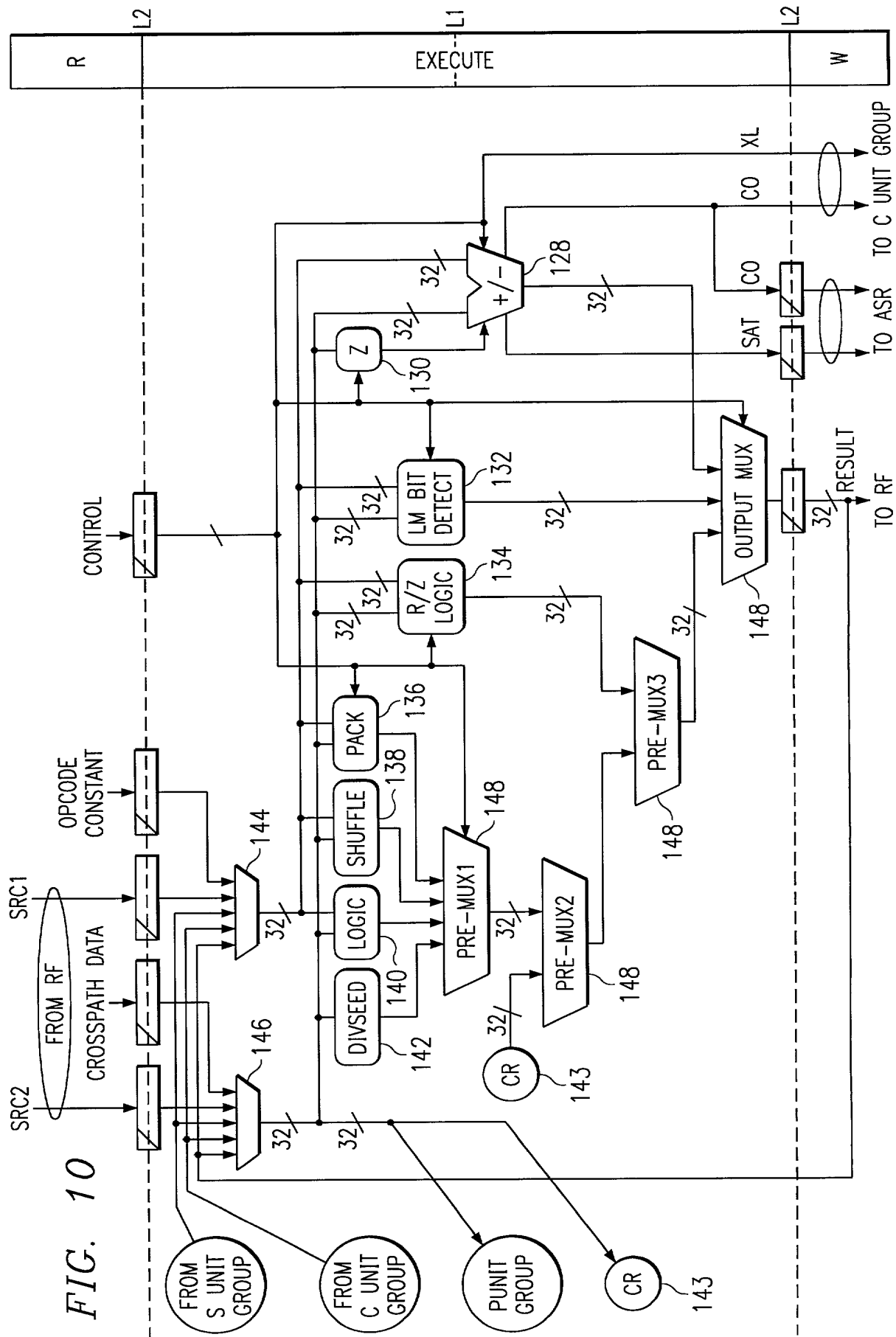
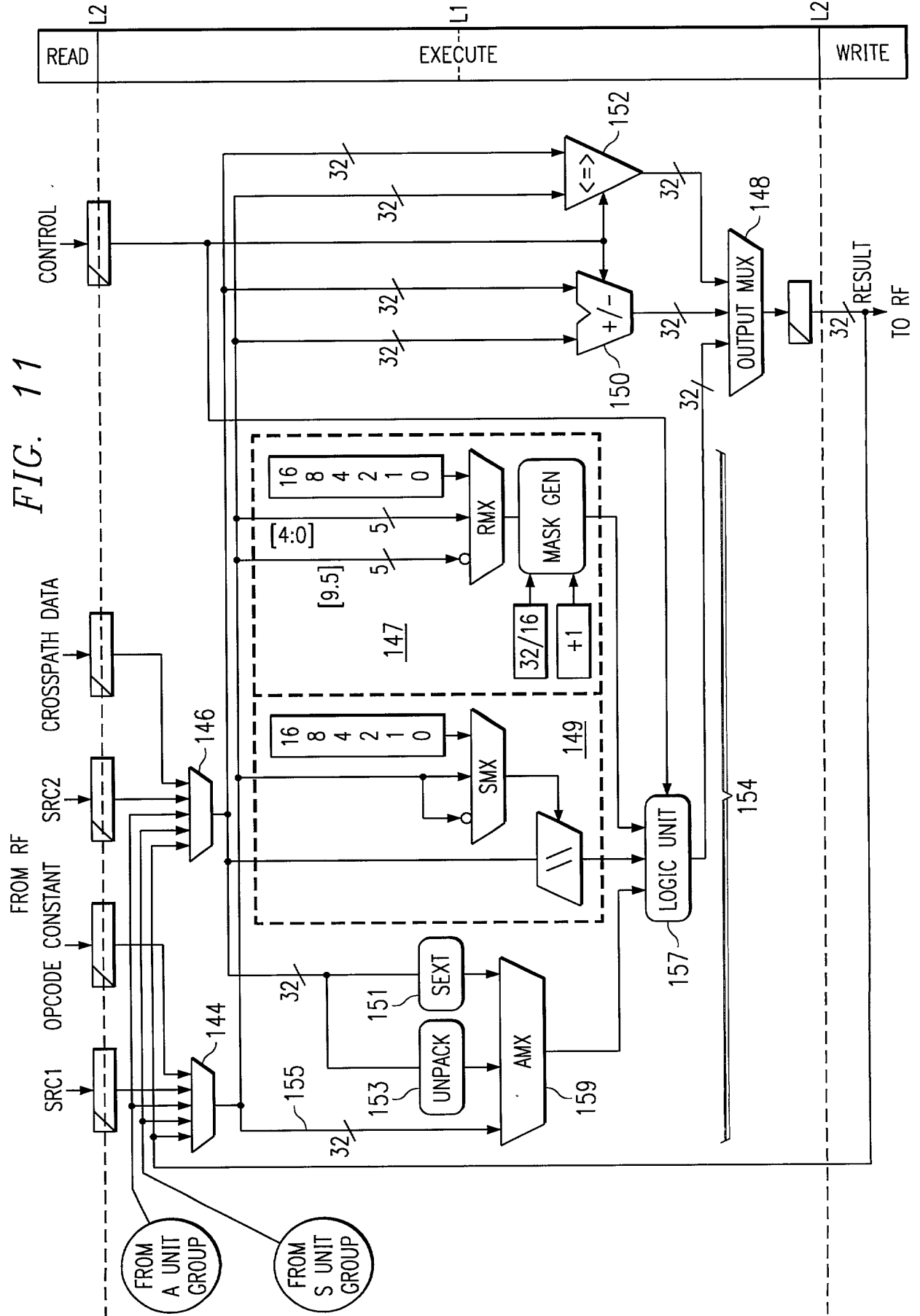
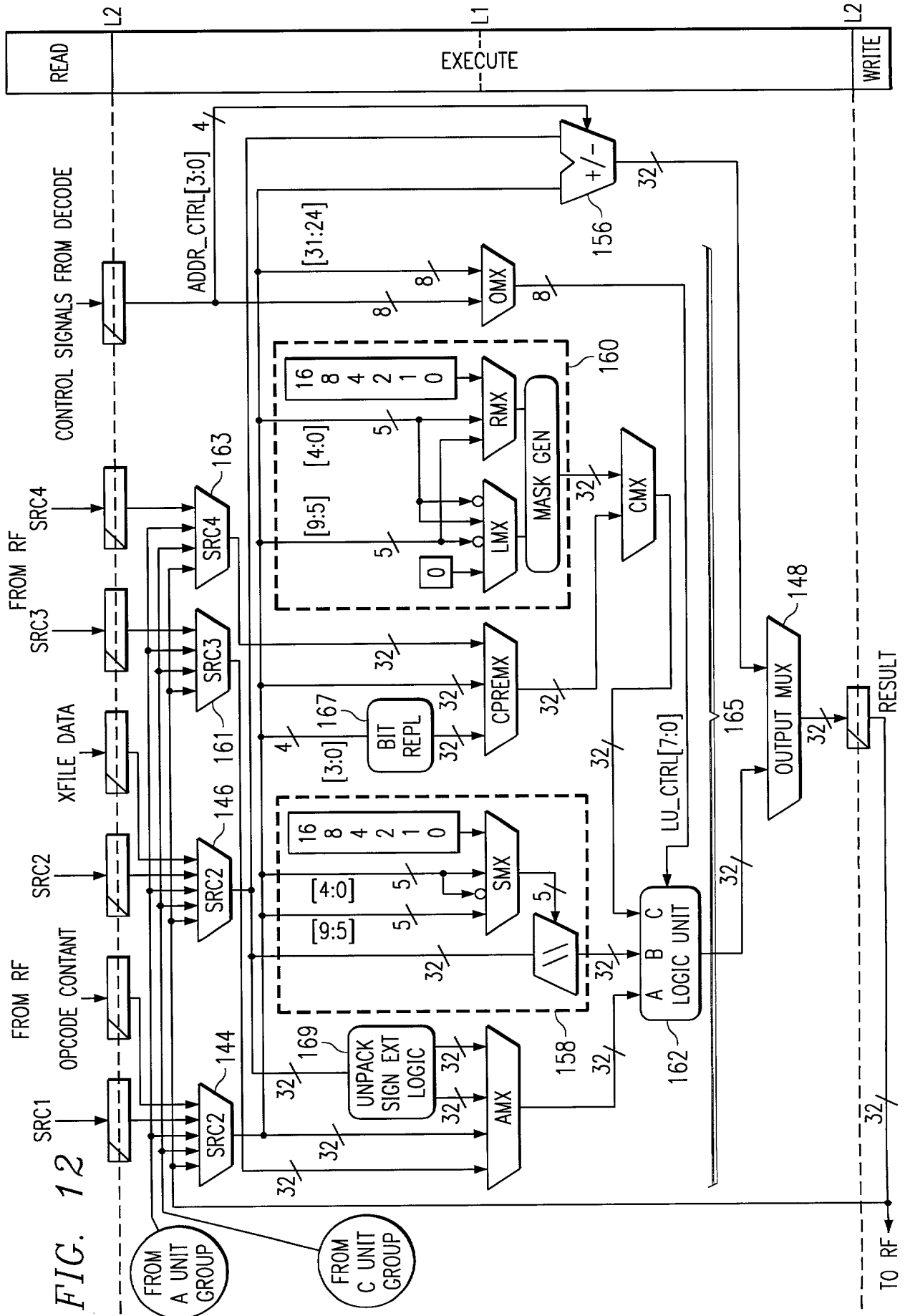


FIG. 11





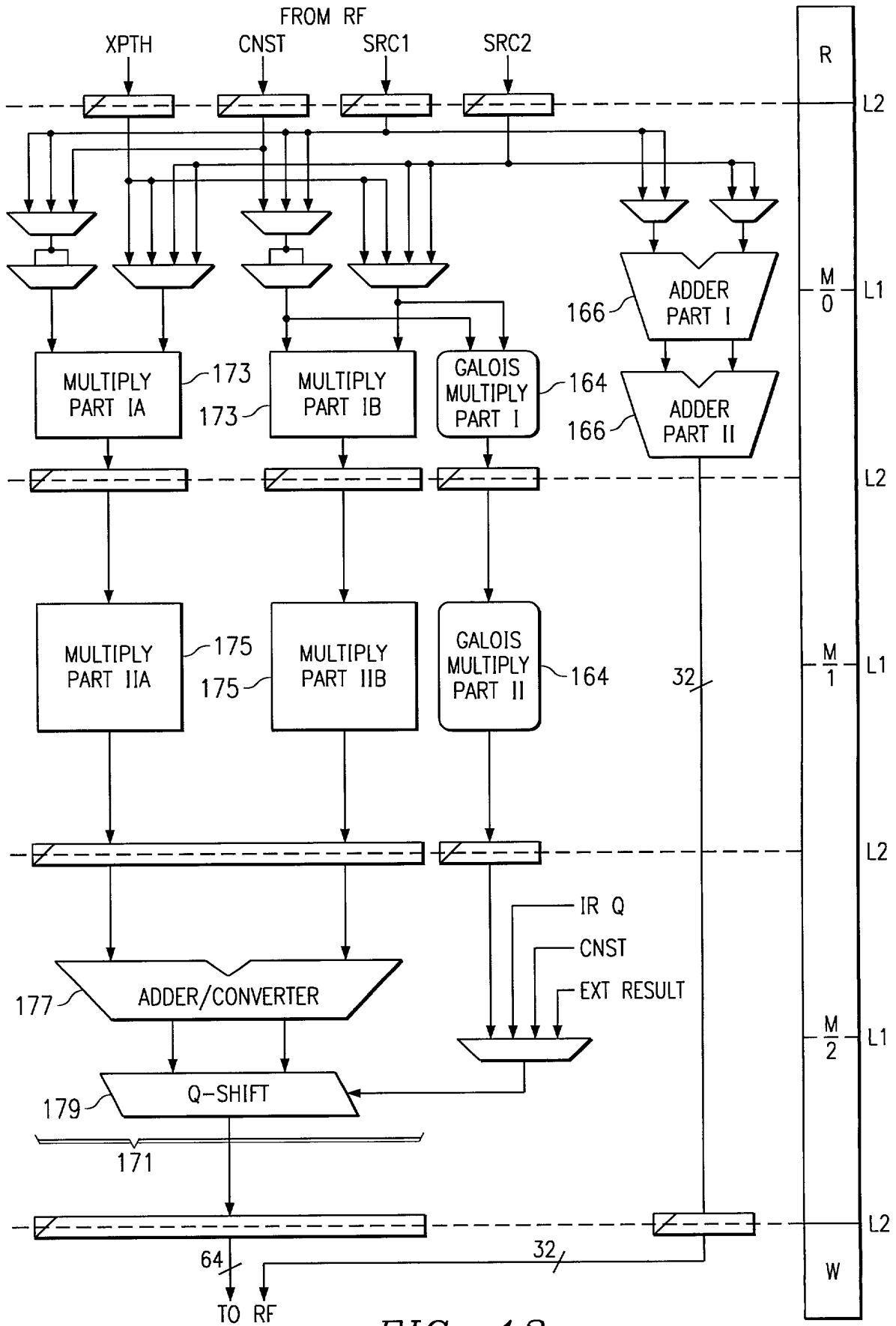


FIG. 13

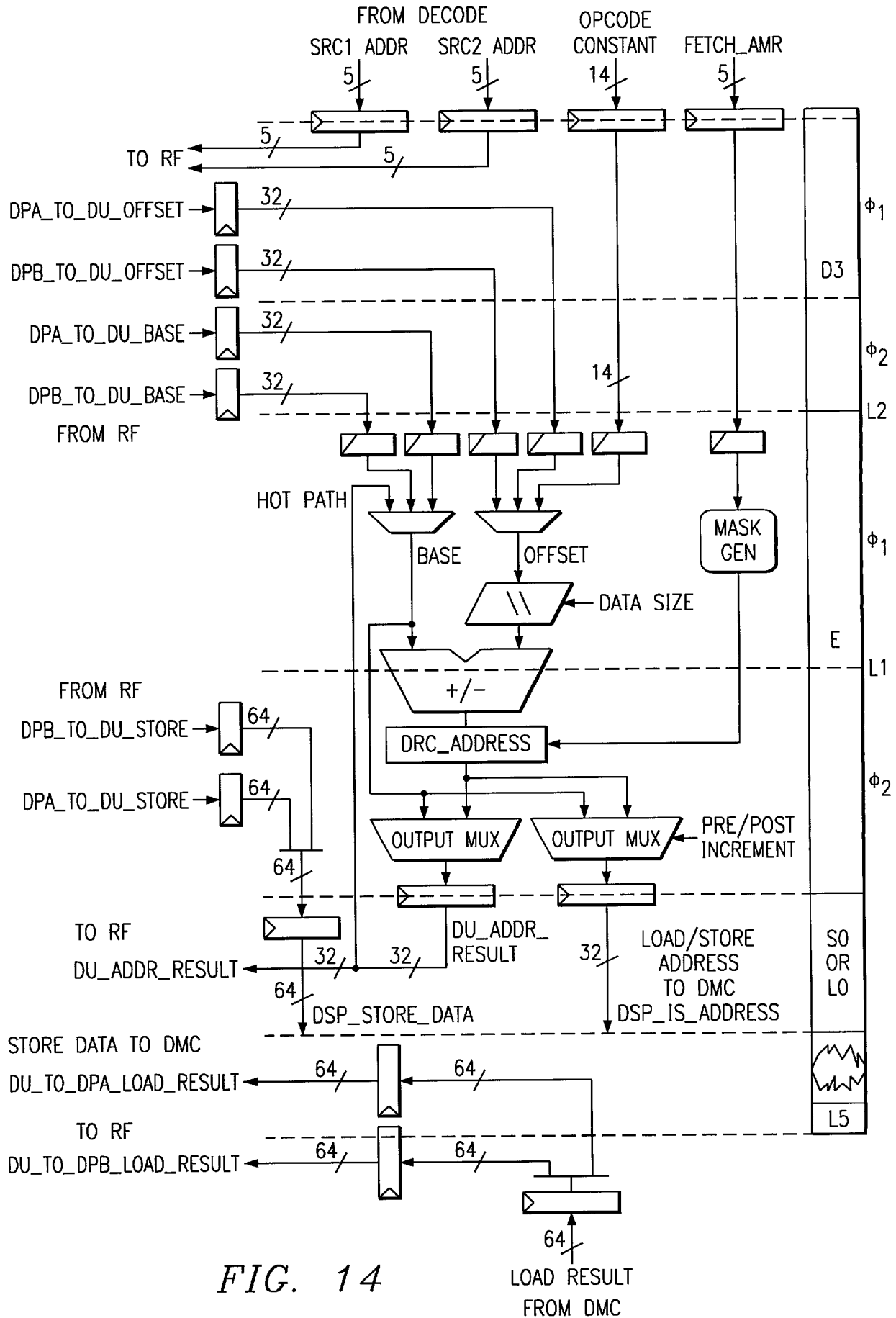


FIG. 14

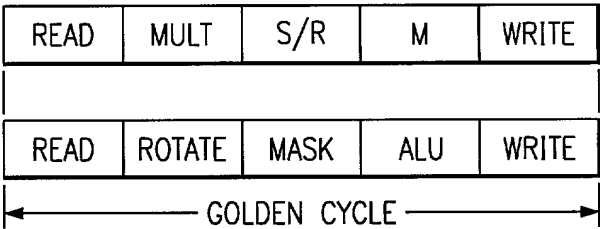


FIG. 16a  
(PRIOR ART)

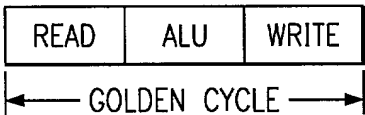


FIG. 16b  
(PRIOR ART)

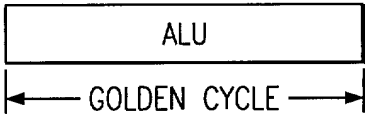


FIG. 16c

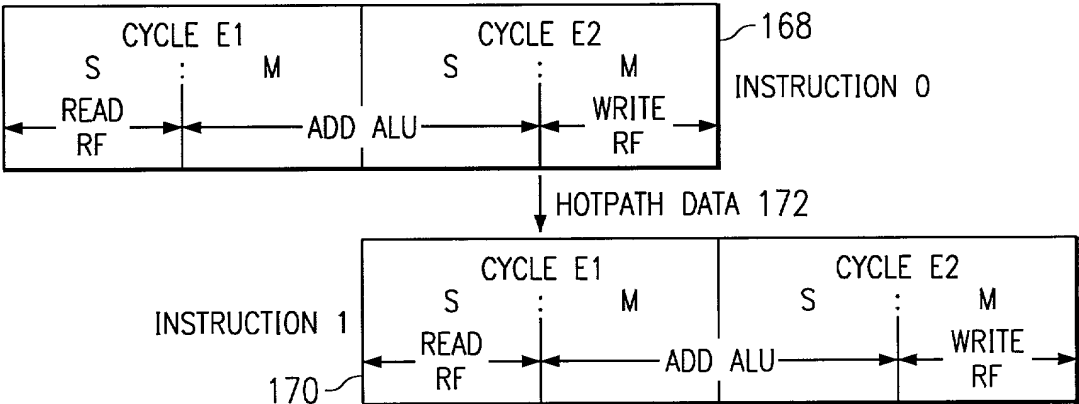


FIG. 17

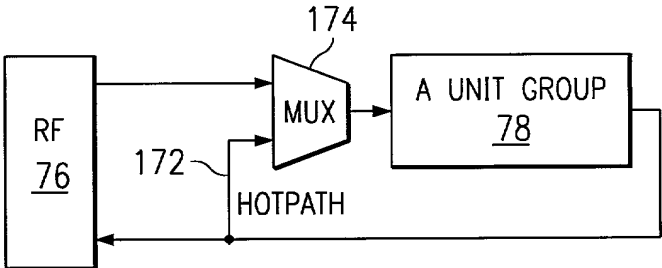
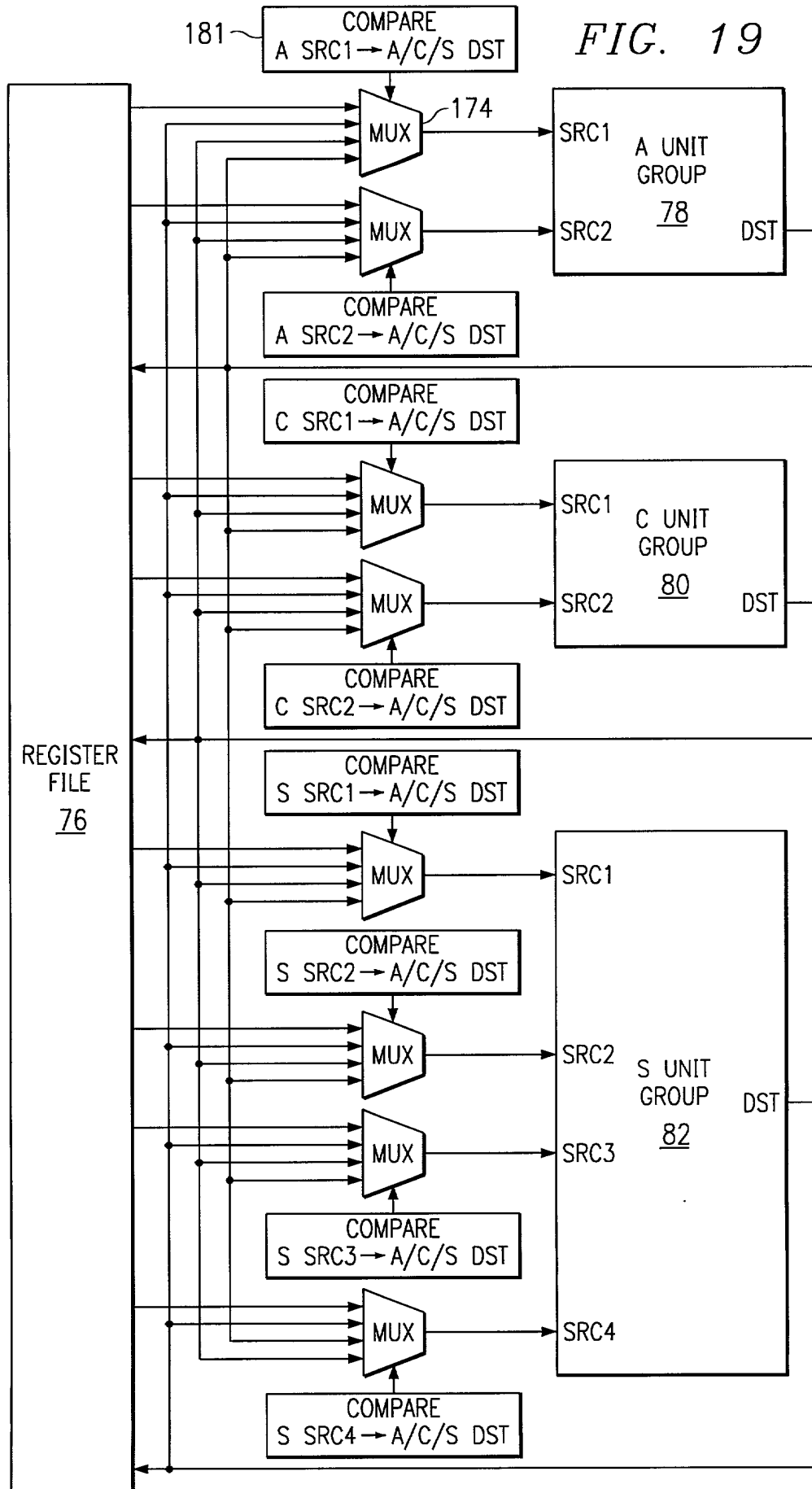


FIG. 18

FIG. 19





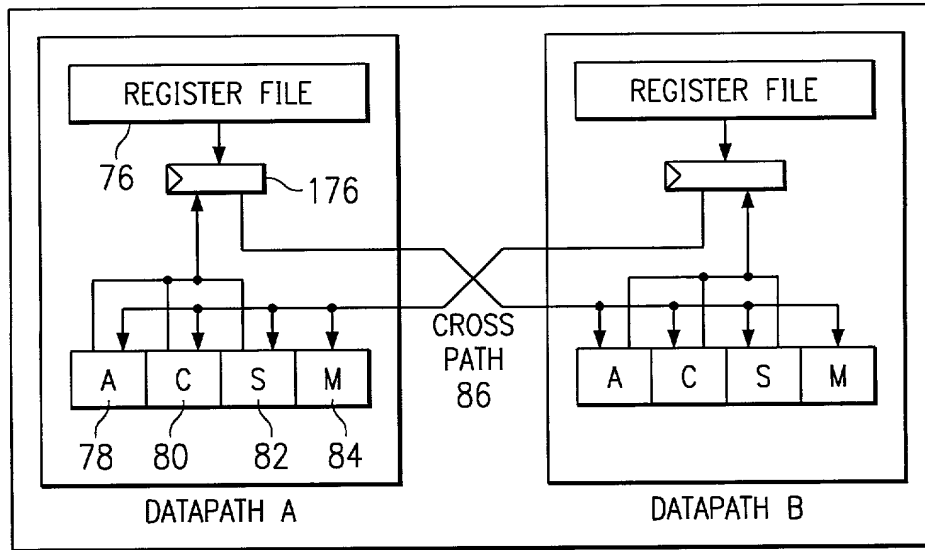


FIG. 20

		SOURCE(S) DATA PATH					
		A,C,S	M (ADD)	M (MUL)	D (LOAD)	D (STORE)	D (ADDR)
SINK(S) IN SAME DATAPATH	A,C,S	0	1	3	7	—	1
	M	1	1	3	7	—	1
	D (LOAD)	—	—	—	—	0	—
	D (STORE)	0	0	2	6	—	0
	D (ADDR:BASE)	1	—	3	7	—	0
	D (ADDR:OFFSET)	1	—	3	7	—	1
	P	0	1	3	7	—	1
SINK(S) IN OPPOSITE DATAPATH	PREDICATION	0	—	2	6	—	0
	A,C,S	1	2	4	8	—	2
	M	1	2	4	8	—	2
	PREDICATION	0	—	2	6	—	0

FIG. 21

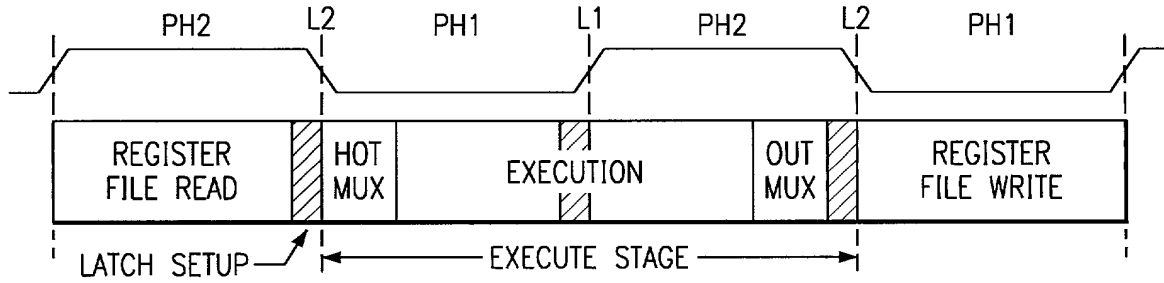


FIG. 22a

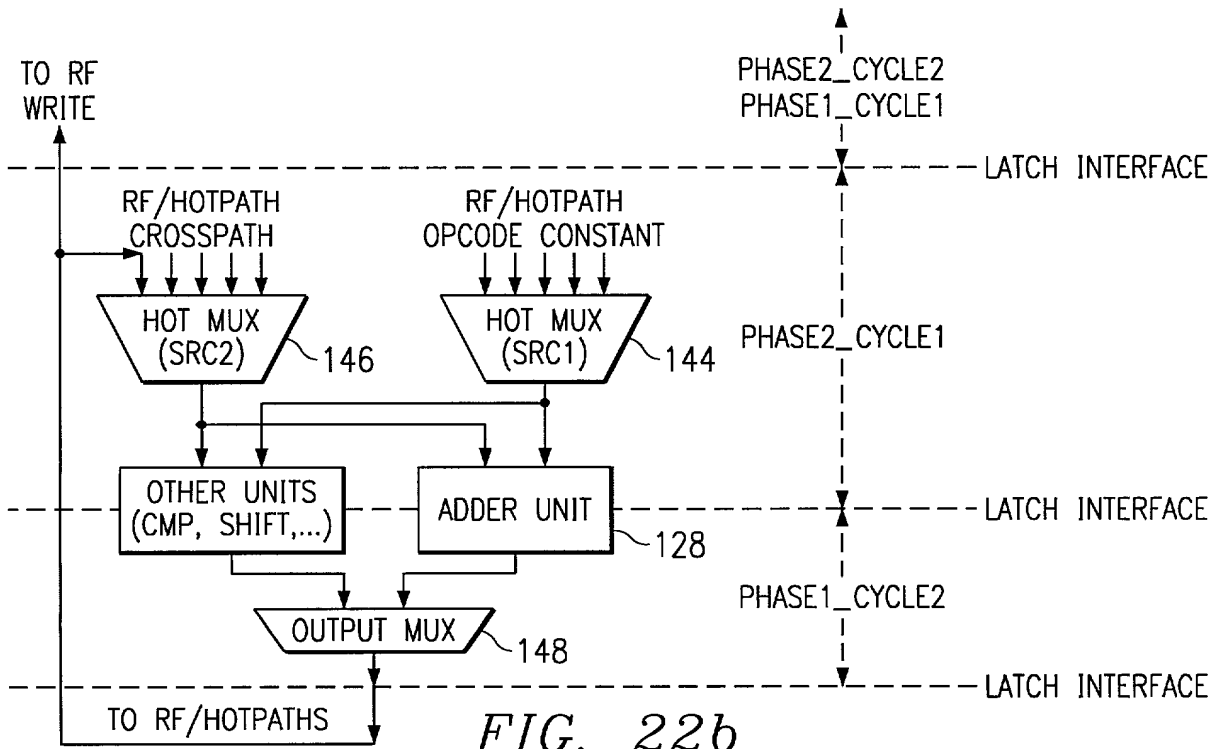


FIG. 22b

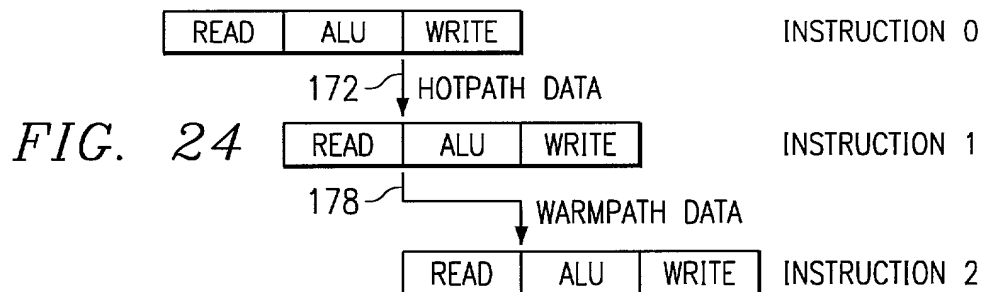


FIG. 24

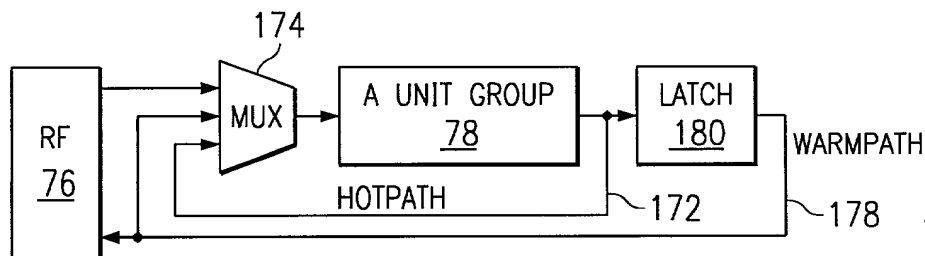
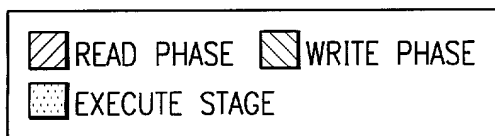


FIG. 25



INSTRUCTION 1	ADD REG1, REG2, REG3
INSTRUCTION 2	ADD REG3, REG4, REG5

HOTPATH AVAILABLE

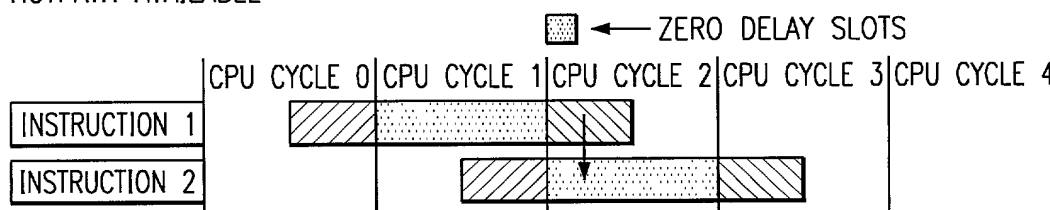


FIG. 23a

HOTPATH UNAVAILABLE

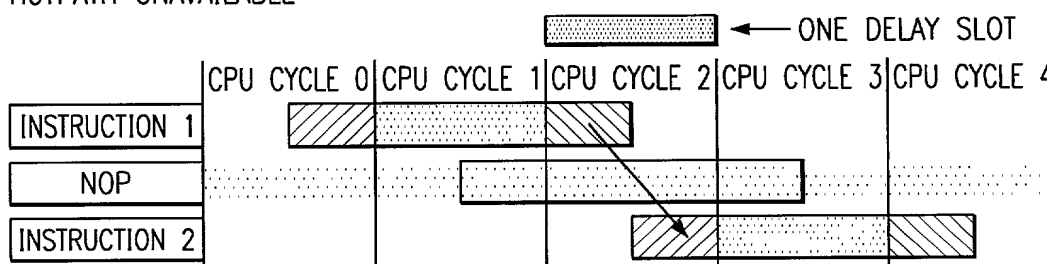


FIG. 23b

CROSSFILE ACCESS WITH HOTPATH AVAILABLE

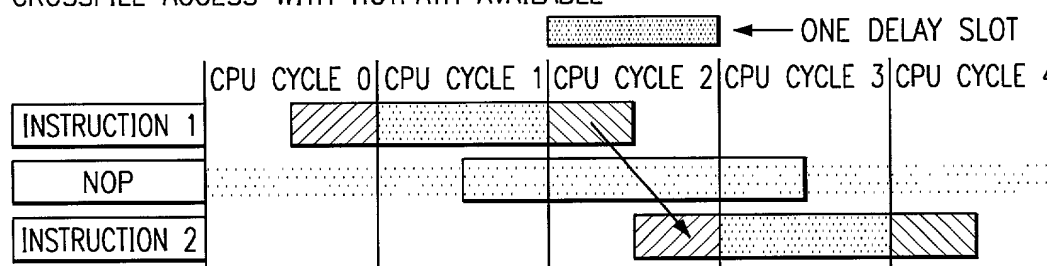


FIG. 23c

CROSSFILE ACCESS WITH HOTPATH UNAVAILABLE

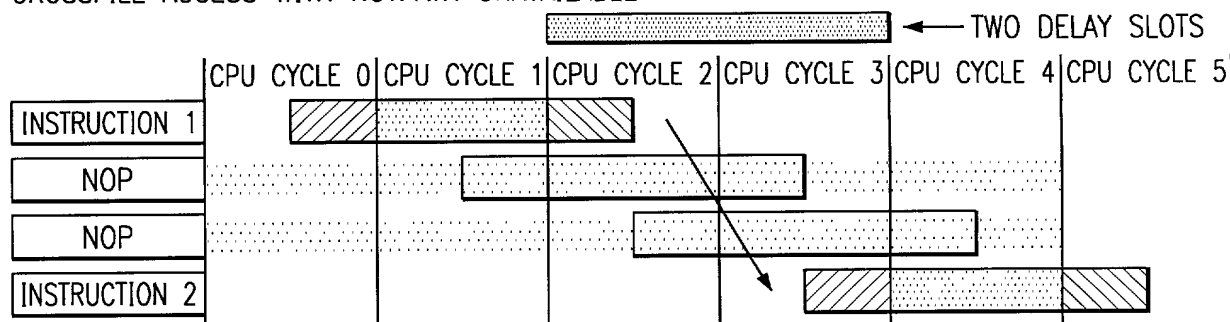


FIG. 23d